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contrary to what one would anticipate, and the waders number only six species. Seven hummingbirds are reported, five being given by Mr. Lawrence on the authority of Capt. J. Xantus. The list is hence evidently more or less incomplete, Col. Grayson mentioning only such as he actually obtained or observed. Unfortunately no dates are given in the notes, and we are hence left in doubt as to the season of occurrence of the birds mentioned.

Socorro Island was visited twice by Col. Grayson, but the chief part of his collections there seems to have been made during the last ten days of May, 1867. The list embraces fourteen species, only five of which were found at the Tres Marias. Several appear to be known as yet only from this island,* and others only from this and the Tres Marias, though each has near relatives on the Mexican main. Among those of special interest obtained here were several specimens of Whitney's owl (*Micrathene Whitneyi* Coues) known formerly only from the single specimen obtained by Dr. Cooper at Fort Mohave, in 1861, but since found also at Mazatlan by Grayson, and in Arizona by Bendire.

The itinerary† given of Col. Grayson's voyages on these expeditions conveys a vivid picture of the dangers as well as annoyance, to which the enthusiastic naturalist is often exposed in the pursuit of his treasures. Though shipwrecked at Socorro, he seems not to have been daunted in his explorations, but extending his researches to other localities, he fell a victim to a fever contracted while collecting at the Isabel Islands, in the summer of 1869.‡ To Col. Grayson ornithologists are chiefly indebted for our present knowledge of the ornithological fauna of northwestern Mexico, and in his death science lost a devotee of rare zeal and industry. —J. A. A.

BOTANY.

LAW OF ANGULAR DIVERGENCE IN THE BRANCHES OF PLANTS. — Mr. Thomas Meehan said that of all the problems that faced the botanist, few seemed more impenetrable than the law which governed the angular divergence in the branches of plants. Some grew quite prostrate and others, though closely allied species, might be strictly erect. At the present season of the year we may note plants with prostrate leaves or branches, which in spring will have them of a sharp, upright angle. The Verbascums at the present time, especially *V. blattaria*, had their root leaves so firmly pressed against the ground, that on lifting they would fall back with a spring; as soon as the central axis grew, the leaves from that would be almost upright. In some respects, erection or prostration became almost specific characters. The *Rubus villosus* usually grew erect even from infancy, and the *Rubus Canadensis* generally trailed; yet the last named would sometimes throw up strong erect stems, which could scarcely be distinguished in that stage from *R. villosus*. Again, the same species of tree would often produce individuals quite erect, and at other times very pendent, and hence we had in horticulture the class of weeping trees. All trees seemed to have this power of producing pendent individuals. The oaks, ashes, poplars, elms, all furnished familiar examples.

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* See Ann. Lyc. Nat. Hist. N. Y. x, pp. 1-18, March, 1871.

† Also published in the "Overland Monthly," September, 1872.

‡ See "Overland Monthly," February, 1870.

It was usual with botanists to pass these things over as "weaknesses." But the term weakness explained nothing. To say that these plants had lost the power of erection was simply restating the primary fact. Moreover, some of these prostrate forms had apparently more vigor than the erect ones. *Rubus Canadensis* was weaker than *R. villosus*, truly; but, on the other hand, some of the Russian trailing junipers were far more vigorous than any of the upright forms. The weeping beech also was in appearance more vigorous than the ordinary forms. All beeches had their young growth pendent. As the growth matured, the branches became erect; but in the weeping form erection did not come with maturity, and hence it remained pendent. In the ashes, however, there was no pendency in the young growth; but the "weeping ash" was one of the most decided of all drooping trees. In such cases as these, the law which governed the angles of divergence must either be different in each case, or operate at different stages of the development of the branches.

In his late travels in the Rocky Mountains, he came on a tract covered profusely with one of the small creeping Euphorbias, probably *E. cordata*, in which a large quantity grew perfectly erect. Sometimes only a portion of the plant exhibited this character, at other times all the plant was upright. The specimens he exhibited were of the erect class. In all these cases the plant was attacked by a small fungus, *Æcidium euphorbiæ*, the *Æ.*

hypericæfolia of Schweinitz. He thought that the fact that this little fungus should be able to make a usually creeping plant, rooting from every joint, entirely lose this character and become erect, was worthy of some notice by students in this branch of botany.—*From remarks made before the Philad. Acad. Sciences.*

CLASSIFICATION OF THE GRAY PINE.—In the last edition of Gray's "Manual," the gray pine (*Pinus Banksiana* Lambert) is classed, according to Dr. Engelmann's arrangement of the species, with *P. inops* Ait. and *P. mitis* Michx., etc., in the group with the fertile catkins and cones lateral. Now, at Tawas Point, Michigan (Lake Huron), I find (June, 1872) this tree in an abundance of instances, with young, half-grown fruit, as well as others with female flowers, bearing them, one or a pair at apex, thus again a few inches lower down, and again farther down along that same branch.

It would be important to know how frequently the female flowers and the fruit are apical (*i. e.* above the leaves) and how often lateral. The facts here given would seem to require a correction in the classification of this tree, placing it, perhaps in an intermediate group, between the two groups already erected. Specimens sent by me to Dr. Engelmann have elicited his surprise as, though he had had plenty of material of *P. Banksiana* from Lake Michigan, he had none showing this disposition of the fruit.

The trees at Tawas Point are, for the gray pine, remarkably large; in many cases reaching the height of fifty feet, the trunk being frequently over a foot in diameter and occasionally eighteen inches through. The specimens collected, however, were from the more stunted usual form, ranging from five to twenty feet high, and which grow on the extremity of the point. I do not think the cones were either as frequently or as much curved as I have observed them to be on this tree further north, for instance at Marquette on Lake Superior.— HENRY GILMAN, *Detroit*, *Michigan.*

THE VEGETABLE NATURE OF DIATOMS.—The Rev. M. J. Berkeley notices in the "Academy" a memoir by Dr. Pfitzer on diatoms, which fully confirms the important observations which were made by Mr. Thwaites, and which "at once settled the question as to the vegetable nature of their singular organisms." The point of special interest in Pfitzer's paper is the elucidation of the mode in which the two portions of the outer silicious envelope overlap each other, thus facilitating the multiplication of the individual as distinct from the fructification. Few matters are more interesting as regards microscopical observation than the mode of propagation, and when the different species of Biddulphia can be readily procured as on our southern coasts, they will afford ample food for many a morning's investigation. The two original halves remain exactly *in statu quo*, and it would be interesting to know how long they would subsist while new intermediate pustules are developed; and the same observation applies to many Desmidiaceæ.

Office of Bud Scales, etc. — Mr. Thomas Meehan referred to some observations made by him last spring before the Academy of Natural Sciences of Philadelphia in regard to the office of bud scales and involucral bracts. The general impression was that they were formed for the purpose of protecting the tender parts beneath. At that time he exhibited branches of *Fraxinus excelsior* on which some of the buds were entirely naked, and others clothed with scales in the usual manner. They could scarcely be for protection in this instance, as both were equally hardy.

He now had to exhibit an ear of corn which had been produced without the usual involucral bracts or husks, and yet was as perfect as if clothed in the usual way, showing that the husk was of not much importance as a protecting agent. An interesting point was that this ear had been formed on the end of a male panicle or tassel. It was not uncommon to find scattered grains of corn amongst male flowers, but a perfect ear like this he had never before seen. The ear was eight-rowed, and contained two hundred perfect grains. It was the variety known as "popcorn."

Seeds as Projectiles. — Mr. Thomas Meehan, at a late meeting of the Academy of Natural Sciences of Philadelphia, said that while travelling through a wood recently he was struck in the face by some seeds of *Hamamelis Virginica*, the common witch hazel, with as much force as if they were spent shot from a gun. Not aware before that these capsules possessed any projecting power, he gathered a quantity in order to ascertain the cause of the projecting force and the measure of its power. Laying the capsules on the floor, he found the seeds were thrown generally four or six feet, and in one instance as much as twelve feet away. The cause of this immense projecting power he found to be simply in the contraction of the horny albumen which surrounded the seed. The seeds were oval and in a smooth bony envelope, and when the albumen had burst and expanded enough to get just beyond the middle where the seed narrowed again, the contraction of the albumen caused the seed to slip out with force, just as we would squeeze out a smooth tapering stone between the finger and thumb.

ALPINE FLOWERS.—Dr. Parry, having devoted the whole summer to a third botanical exploration of the Colorado Rocky Mountains, has prepared beautiful sets of the more remarkable and novel Alpine flowers of the region, consisting of above a hundred species. A limited number of these sets, interesting as *souvenirs* of travel as well as to botanists, may be obtained for twelve dollars a set upon application to Dr. Parry at Davenport, Iowa, or to the Naturalists' Agency in Salem.—A. G.

ZOOLOGY.

THE ZOOLOGICAL STATION OF NAPLES.— An undertaking which cannot fail to have an important influence on the progress of zoology has been started at Naples. A zoological station to be in charge of a permanent zoological observer and opened under certain restrictions to all workers who may wish to avail themselves of its facilities. It will form the natural complement of the advantages zoologists and anatomists now derive from the great zoological gardens of London and Paris, which constantly supply so much valuable material for study to the members of the Zoological Society of London and the Professors of the Jardin des Plantes. Hitherto all the work done on the seashore has necessarily been more or less interrupted; usually a stay of a few weeks at one place has been the utmost length of time which naturalists have been able to devote to one of the most fruitful branches of research in Zoology. Occasionally a more favored individual spends a few months on the seashore, but these are exceptions. All who have had occasion to pursue embryological studies on the seashore, or to trace the habits and study the anatomy of our marine animals, know how difficult it is to obtain just the material which is wanted. To make a complete embryology of a single marine animal often requires several years of unremitting devotion to one subject and, in order to obtain missing links, one must study on the